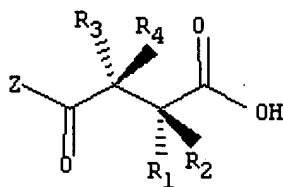


## CLAIMS

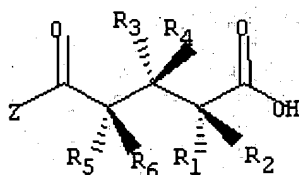
This listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently Amended) A method for inhibiting osteoclast formation in a subject in need thereof, comprising the step of administering a pharmaceutically effective amount of a an isolated compound of the general formula  $\text{ZOC}-(\text{CRR})_m\text{-COOH}$ , wherein:  $m = 2, 3$  or  $4$ ;  $Z$  is  $\text{OH}$  or  $\text{NH}_2$ ; one  $R$  in the compound is from the group consisting of  $\text{SO}_3\text{H}$ ,  $\text{OSO}_3\text{H}$ ,  $\text{CH}_2\text{-SO}_3\text{H}$ ,  $\text{CH}_2\text{-OSO}_3\text{H}$ , and  $\text{NHSO}_3\text{H}$ , and the remaining  $R$ s are  $\text{H}$  or  $\text{NH}_2$ , optionally with an additive, excipient, diluent or carrier.
2. (Original) The method according to claim 1, for inhibiting formation of mononuclear TRAP-positive osteoclasts.
3. (Original) The method according to claim 1, for inhibiting formation of multinuclear TRAP-positive osteoclasts.
4. (Original) The method according to claim 1, wherein the pharmaceutically effective amount is 5 to 10 mg/kg of body weight.
5. (Original) The method according to claim 1, comprising administering the compound for between 5 and 30 days.
6. (Original) The method according to claim 1, comprising administering the compound for at least 30 days.
7. (Original) The method according to claim 1, comprising administering the compound for at least 60 days.
8. (Original) The method according to claim 1, comprising administering the compound for at least 90 days.
9. (Original) The method according to claim 1, wherein the compound has the structure shown below and the formula  $\text{ZOC-CR}_3\text{R}_4\text{-CR}_1\text{R}_2\text{-COOH}$ , wherein one of  $R_1$  to  $R_4$  is selected from the group consisting of  $\text{SO}_3\text{H}$ ,  $\text{OSO}_3\text{H}$ ,  $\text{CH}_2\text{-SO}_3\text{H}$ ,  $\text{CH}_2\text{-OSO}_3\text{H}$ , and  $\text{NHSO}_3\text{H}$ , and the remaining are  $\text{H}$  or  $\text{NH}_2$ .



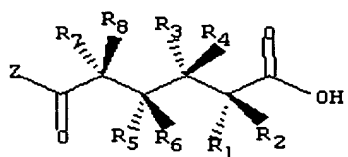
Structure 1

10. (Withdrawn) The method according to claim 1, wherein the compound has the structure shown below and the formula  $\text{ZOC-CR}_5\text{R}_6\text{-CR}_3\text{R}_4\text{-CR}_1\text{R}_2\text{-COOH}$ , wherein one of  $\text{R}_1$  to  $\text{R}_6$  is selected from the group consisting of  $\text{SO}_3\text{H}$ ,  $\text{OSO}_3\text{H}$ ,  $\text{CH}_2\text{-SO}_3\text{H}$ ,  $\text{CH}_2\text{-OSO}_3\text{H}$ , and  $\text{NHSO}_3\text{H}$ , and the remaining are H or  $\text{NH}_2$ .



Structure 2

11. (Withdrawn) The method according to claim 1, wherein the compound has the structure shown below and the formula  $\text{ZOC-CR}_7\text{R}_8\text{-CR}_5\text{R}_6\text{-CR}_3\text{R}_4\text{-CR}_1\text{R}_2\text{-COOH}$ , wherein one of  $\text{R}_1$  to  $\text{R}_8$  is selected from the group consisting of  $\text{SO}_3\text{H}$ ,  $\text{OSO}_3\text{H}$ ,  $\text{CH}_2\text{-SO}_3\text{H}$ ,  $\text{CH}_2\text{-OSO}_3\text{H}$ , and  $\text{NHSO}_3\text{H}$ , and the remaining are H or  $\text{NH}_2$ .



structure 3

12. (Original) The method according to claim 9, wherein the compound is selected from the group consisting of:
1. L- Aspartic acid, N-Sulfonic acid,
  2. L-Aspartic acid, 2 $\beta$ -sulfonic acid,
  3. L-Aspartic acid, 2 $\beta$ -sulfate,
  4. L-aspartic acid, 3 $\alpha$  -sulfonic acid,
  5. L-aspartic acid, 3 $\alpha$ -sulfate,
  6. L-aspartic acid, 3 $\beta$ -sulfonic acid,
  7. L-aspartic acid, 3 $\beta$ -sulfate,
  8. 2 $\alpha$ , 3-dicarboxy, propane-1-sulfonic acid,
  9. 2 $\alpha$ ,3-dicarboxy, propane-1-sulfate,
  10. 1 $\alpha$ ,2-carboxy ethane sulfonic acid,
  11. 1 $\alpha$ ,2-carboxy ethane sulfate,
  12. D-aspartic acid, N-sulfonic acid,
  13. 2 $\beta$ ,3-carboxy,propane-1-sulfonic acid,
  14. 2 $\beta$ ,3-carboxy,propane-1-sulfate,
  15. 1 $\beta$ ,2-carboxy ethane-1-sulfonic acid,
  16. 1 $\beta$ ,2-carboxy ethane-1-sulfate,
  17. D-aspartic acid, 2 $\alpha$ -sulfonic acid,
  18. D-aspartic acid, 2 $\alpha$  -sulfonic acid,
  19. D-Aspartic acid, 3 $\alpha$  -sulfonic acid,
  20. D-Aspartic acid, 3 $\alpha$ -sulfate,
  21. D-Aspartic acid, 3 $\beta$ -sulfonic acid,
  22. D-aspartic acid, 3 $\beta$ -sulfate,

23. L-asparagine, N-sulfonic acid,
  24. 2 $\alpha$ -carboxy, 3-carboxamido, propane-1-sulfonic acid,
  25. 2 $\alpha$ -carboxy, 3-carboxamido, propane-1-sulfate,
  26. 1 $\alpha$ -carboxy, 2-carboxamido, ethane sulfonic acid,
  27. 1 $\alpha$ -carboxy, 2-carboxamido, ethane sulfate,
  28. L-asparagine, 2 $\beta$ -sulfonic acid,
  29. L-asparagine, 2 $\beta$ -sulfate,
  30. L-asparagine, 3 $\alpha$ -sulfonic acid,
  31. L-asparagine, 3 $\alpha$ -sulfate,
  32. L-asparagine, 3 $\beta$ -sulfonic acid,
  33. L-asparagine, 3 $\beta$ -sulfate,
  34. D-asparagine, N-sulfonic acid,
  35. 2 $\beta$ -carboxy, 3-carboxamido, propane-1-sulfonic acid,
  36. 2 $\beta$ -carboxy, 3-carboxamido, propane-1-sulfate,
  37. 1 $\beta$ -carboxy, 2-carboxamido, ethane sulfonic acid,
  38. 1 $\beta$ -carboxy, 2-carboxamido, ethane sulfate,
  39. D-asparagine, 2 $\alpha$ -sulfonic acid,
  40. D-asparagine, 2 $\alpha$ -sulfate,
  41. D-asparagine, 3 $\alpha$ -sulfonic acid,
  42. D-asparagine, 3 $\alpha$ -sulfate,
  43. D-asparagine, 3 $\beta$ -sulfonic acid,
  44. D-asparagine, 3 $\beta$ -sulfate.
13. (Withdrawn) The method according to claim 10, wherein the compound is selected from the group consisting of:
- (I) L-glutamic acid, N-sulfonic acid,
  - (II) 2 $\alpha$ , 4-dicarboxy, butane-1-sulfonic acid,
  - (III) 2 $\alpha$ , 4-dicarboxy, butane-1-sulfate,
  - (IV) 1 $\alpha$ , 3-dicarboxy, propane sulfonic acid,
  - (V) 1 $\alpha$ , 3-dicarboxy, propane sulfate,
  - (VI) 1 $\beta$ , 3-dicarboxy, propane sulfate,

- (VII) 1 $\beta$ , 3-dicarboxy, propane sulfonic acid,
- (VIII) L-glutamic acid, 2 $\beta$ -sulfonic acid,
- (IX) L-glutamic acid, 2 $\beta$ -sulfate,
- (X) L-glutamic acid, 3 $\alpha$ -sulfonic acid,
- (XI) L-glutamic acid, 3 $\alpha$ -sulfate,
- (XII) L-glutamic acid, 3 $\beta$ -sulfonic acid,
- (XIII) L-glutamic acid, 3 $\beta$ -sulfate,
- (XIV) L-glutamic acid, 4 $\alpha$ -sulfonic acid,
- (XV) L-glutamic acid, 4 $\alpha$ -sulfate,
- (XVI) L-glutamic acid, 4 $\beta$ -sulfonic acid,
- (XVII) L-glutamic acid, 4 $\beta$ -sulfate,
- (XVIII) D-glutamic acid, N-sulfonic acid,
- (XIX) 2 $\beta$ , 4-dicarboxy, butane-1-sulfonic acid,
- (XX) 2 $\beta$ , 4-dicarboxy, butane-1-sulfate,
- (XXI) D-glutamic acid, 2 $\alpha$ -sulfonic acid,
- (XXII) D-glutamic acid, 2 $\alpha$ -sulfate,
- (XXIII) D-glutamic acid, 3 $\alpha$ -sulfonic acid,
- (XXIV) D-glutamic acid, 3 $\alpha$ -sulfate,
- (XXV) D-glutamic acid, 3 $\beta$ -sulfonic acid,
- (XXVI) D-glutamic acid, 3 $\beta$ -sulfate,
- (XXVII) D-glutamic acid, 4 $\alpha$ -sulfonic acid,
- (XXVIII) D-glutamic acid, 4 $\alpha$ -sulfate,
- (XXIX) D-glutamic acid, 4 $\beta$ -sulfonic acid,
- (XXX) D-glutamic acid, 4 $\beta$ -sulfate,
- (XXXI) L-glutamine, N-sulfonic acid,
- (XXXII) L-glutamine, 2 $\beta$ -sulfonic acid,
- (XXXIII) L-glutamine, 2 $\beta$ -sulfate,
- (XXXIV) L-glutamine, 3 $\alpha$ -sulfonic acid,
- (XXXV) L-glutamine, 3 $\alpha$ -sulfate,
- (XXXVI) L-glutamine, 3 $\beta$ -sulfonic acid,

- (XXXVII) L-glutamine, 3 $\beta$ -sulfate,
- (XXXVIII) L-glutamine, 4 $\alpha$ -sulfonic acid,
- (XXXIX) L-glutamine, 4 $\alpha$ -sulfate,
- (XL) L-glutamine, 4 $\beta$ -sulfonic acid,
- (XLI) L-glutamine, 4 $\beta$ -sulfate,
- (XLII) 2 $\alpha$ -carboxy, 4-carboxamido, butane-1-sulfonic acid,
- (XLIII) 2 $\alpha$ -carboxy, 4-carboxamido, butane-1-sulfate,
- (XLIV) 1 $\alpha$ -carboxy, 3-carboxamido, propane-1-sulfonic acid,
- (XLV) 1 $\alpha$ -carboxy, 3-carboxamido, propane-1-sulfate,
- (XLVI) 1 $\beta$ -carboxy, 3-carboxamido, propane-1-sulfate,
- (XLVII) 1 $\beta$ -carboxy, 3-carboxamido, propane-1-sulfonic acid,
- (XLVIII) D-glutamine, N-sulfonic acid,
- (XLIX) 2 $\beta$ -carboxy, 4-carboxamido, butane-1-sulfonic acid,
- (L) 2 $\beta$ -carboxy, 4-carboxamido, butane-1-sulfate,
- (LI) D-glutamine, 2 $\alpha$ -sulfonic acid,
- (LII) D-glutamine, 2 $\alpha$ -sulfate,
- (LIII) D-glutamine, 3 $\alpha$ -sulfonic acid,
- (LIV) D-glutamine, 3 $\alpha$ -sulfate,
- (LV) D-glutamine, 3 $\beta$ -sulfonic acid,
- (LVI) D-glutamine, 3 $\beta$ -sulfate,
- (LVII) D-glutamine, 4 $\alpha$ -sulfonic acid,
- (LVIII) D-glutamine, 4 $\alpha$ -sulfate,
- (LIX) D-glutamine, 4 $\beta$ -sulfonic acid,
- (LX) D-glutamine, 4 $\beta$ -sulfate.

14. (Withdrawn) The method according to claim 11, wherein the compound is selected from the group consisting of:

- (I) L-homoglutamic acid, N-sulfonic acid,
- (II) Pentane-2 $\alpha$ , 5-dicarboxy-1-sulfonic acid,
- (III) Pentane-2 $\alpha$ , 5-dicarboxy-1-sulfate,
- (IV) Butane-1 $\alpha$ , 4-dicarboxy-1-sulfonic acid,

- (V) Butane-1 $\alpha$ , 4-dicarboxy-1-sulfate,
- (VI) L-homoglutamic acid, 2 $\beta$ -sulfonic acid,
- (VII) L-homoglutamic acid, 2 $\beta$ -sulfate,
- (VIII) L-homoglutamic acid, 3 $\alpha$ -sulfonic acid,
- (IX) L-homoglutamic acid, 3 $\alpha$ -sulfate,
- (X) L-homoglutamic acid, 3 $\beta$ -sulfonic acid,
- (XI) L-homoglutamic acid, 3 $\beta$ -sulfate,
- (XII) L-homoglutamic acid, 4 $\alpha$ -sulfonic acid,
- (XIII) L-homoglutamic acid, 4 $\alpha$ -sulfate,
- (XIV) L-homoglutamic acid, 4 $\beta$ -sulfonic acid,
- (XV) L-homoglutamic acid, 4 $\beta$ -sulfate,
- (XVI) L-homoglutamic acid, 5 $\alpha$ -sulfonic acid,
- (XVII) L-homoglutamic acid, 5 $\alpha$ -sulfate,
- (XVIII) L-homoglutamic acid, 5 $\beta$ -sulfonic acid,
- (XIX) L-homoglutamic acid, 5 $\beta$ -sulfate,
- (XX) D-homoglutamic acid, N-sulfonic acid,
- (XXI) Pentane-2 $\beta$ , 5-dicarboxy-1-sulfonic acid,
- (XXII) Pentane-2 $\beta$ , 5-dicarboxy-1-sulfate,
- (XXIII) Butane-1 $\beta$ , 4-dicarboxy-1-sulfonic acid,
- (XXIV) Butane-1 $\beta$ , 4-dicarboxy-1-sulfate,
- (XXV) D-homoglutamic acid, 2 $\alpha$ -sulfonic acid,
- (XXVI) D-homoglutamic acid, 2 $\alpha$ -sulfate,
- (XXVII) D-homoglutamic acid, 3 $\alpha$ -sulfonic acid,
- (XXVIII) D-homoglutamic acid, 3 $\alpha$ -sulfate,
- (XXIX) D-homoglutamic acid, 3 $\beta$ -sulfonic acid,
- (XXX) D-homoglutamic acid, 3 $\beta$ -sulfate,
- (XXXI) D-homoglutamic acid, 4 $\alpha$ -sulfonic acid,
- (XXXII) D-homoglutamic acid, 4 $\alpha$ -sulfate,
- (XXXIII) D-homoglutamic acid, 4 $\beta$ -sulfonic acid,
- (XXXIV) D-homoglutamic acid, 4 $\beta$ -sulfate,

- (XXXV) D-homoglutamic acid, 5 $\alpha$ -sulfonic acid,
- (XXXVI) D-homoglutamic acid, 5 $\alpha$ -sulfate,
- (XXXVII) D-homoglutamic acid, 5 $\beta$ -sulfonic acid,
- (XXXVIII) D-homoglutamic acid, 5 $\beta$ -sulfate,
- (XXXIX) L-homoglutamine, N-sulfonic acid,
- (XL) Pentane-2 $\alpha$ -carboxy, 5-carboxamido-1-sulfonic acid,
- (XLI) Pentane-2 $\alpha$ -carboxy, 5-carboxamido-1-sulfate,
- (XLII) Butane-1 $\alpha$ -carboxy, 4-carboxamido-1-sulfonic acid,
- (XLIII) Butane-1 $\alpha$ -carboxy, 4-carboxamido-1-sulfate,
- (XLIV) L-homoglutamine, 2 $\beta$ -sulfonic acid,
- (XLV) L-homoglutamine, 2 $\beta$ -sulfate,
- (XLVI) L-homoglutamine, 3 $\alpha$ -sulfonic acid,
- (XLVII) L-homoglutamine, 3 $\alpha$ -sulfate,
- (XLVIII) L-homoglutamine, 3 $\beta$ -sulfonic acid,
- (XLIX) L-homoglutamine, 3 $\beta$ -sulfate,
- (L) L-homoglutamine, 4 $\alpha$ -sulfonic acid,
- (LI) L-homoglutamine, 4 $\alpha$ -sulfate,
- (LII) L-homoglutamine, 4 $\beta$ -sulfonic acid,
- (LIII) L-homoglutamine, 4 $\beta$ -sulfate,
- (LIV) L-homoglutamine, 5 $\alpha$ -sulfonic acid,
- (LV) L-homoglutamine, 5 $\alpha$ -sulfate,
- (LVI) L-homoglutamine, 5 $\beta$ -sulfonic acid,
- (LVII) L-homoglutamine, 5 $\beta$ -sulfate,
- (LVIII) D-homoglutamine, N-sulfonic acid,
- (LIX) Pentane-2 $\beta$ -carboxy, 5-carboxamido-1-sulfonic acid,
- (LX) Pentane-2 $\beta$ -carboxy, 5-carboxamido-1-sulfate,
- (LXI) Butane-1  $\beta$  -carboxy, 4-carboxamido-1-sulfonic acid,
- (LXII) Butane-1  $\beta$  -carboxy, 4-carboxamido-1-sulfate,
- (LXIII) D-homoglutamine, 2 $\alpha$ -sulfonic acid,
- (LXIV) D-homoglutamine, 2 $\alpha$ -sulfate,

- (LXV) D-homoglutamine, 3 $\alpha$ -sulfonic acid,
- (LXVI) D-homoglutamine, 3 $\alpha$ -sulfate,
- (LXVII) D-homoglutamine, 3 $\beta$ -sulfonic acid,
- (LXVIII) D-homoglutamine, 3 $\beta$ -sulfate,
- (LXIX) D-homoglutamine, 4 $\alpha$ -sulfonic acid,
- (LXX) D-homoglutamine, 4 $\alpha$ -sulfate,
- (LXXI) D-homoglutamine, 4 $\beta$ -sulfonic acid,
- (LXXII) D-homoglutamine, 4 $\beta$ -sulfate,
- (LXXIII) D-homoglutamine, 5 $\alpha$ -sulfonic acid,
- (LXXIV) D-homoglutamine, 5 $\alpha$ -sulfate,
- (LXXV) D-homoglutamine, 5 $\beta$ -sulfonic acid,
- (LXXVI) D-homoglutamine, 5 $\beta$ -sulfate.

Claims 15-28. (Cancelled)